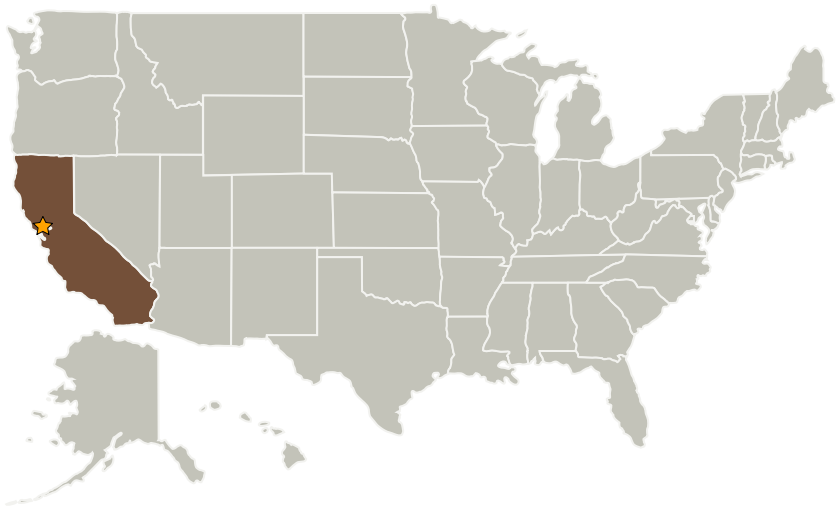
Wireless Health Monitoring for Large Arrays of MEMS Sensors and Actuators, Phase I

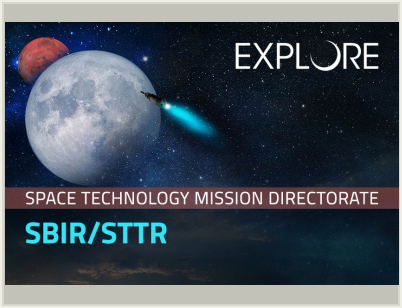
Completed Technology Project (2006 - 2006)

Project Introduction

The objective of this Phase I project is to demonstrate an automated on-line structural health monitoring system for aircraft structures using a combination of wireless data acquisition and fault detection filter via a sensing network for vehicle-embedded large arrays of MEMS sensors and actuators. A fault detection filter, whose functions are to identify and localize the damage, is considered as a new concept in the field of structural health monitoring. Sensor validation is implemented in the distributed sensor network to ensure only validated data are sent to the central station for further system utilization. Wireless communication provides a safe, affordable, and more efficient method for the online health monitoring of vehicle subsystems and information monitoring. It also involves signal processing to support decision-making related to safety, maintenance, or operating procedures.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
American GNC Corporation	Supporting Organization	Industry Small Disadvantaged Business (SDB), Women-Owned Small Business (WOSB)	Simi Valley, California

Primary U.S. Work Locations
California

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX10 Autonomous Systems
  - TX10.2 Reasoning and Acting
    - TX10.2.5 Fault Diagnosis and Prognosis